PYRAMID
COMMUNICATIONS

Programming Instructions for:

Motorola CDM1550LS+
PassPort (Data on Primary Talk Group)

For use with:

Pyramid Communications
Model 2017 Merlin/2012/3012 MDT

Revision A
September 29, 2006

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Introduction

Before you begin, you will need to have a copy of the Professional Radio CPS software, and a Motorola RIB available to program the mobile radio. Also, you will need a copy of the Pyramid programming software and FY-1 programming cable to program the Pyramid device.

Mobile Configuration

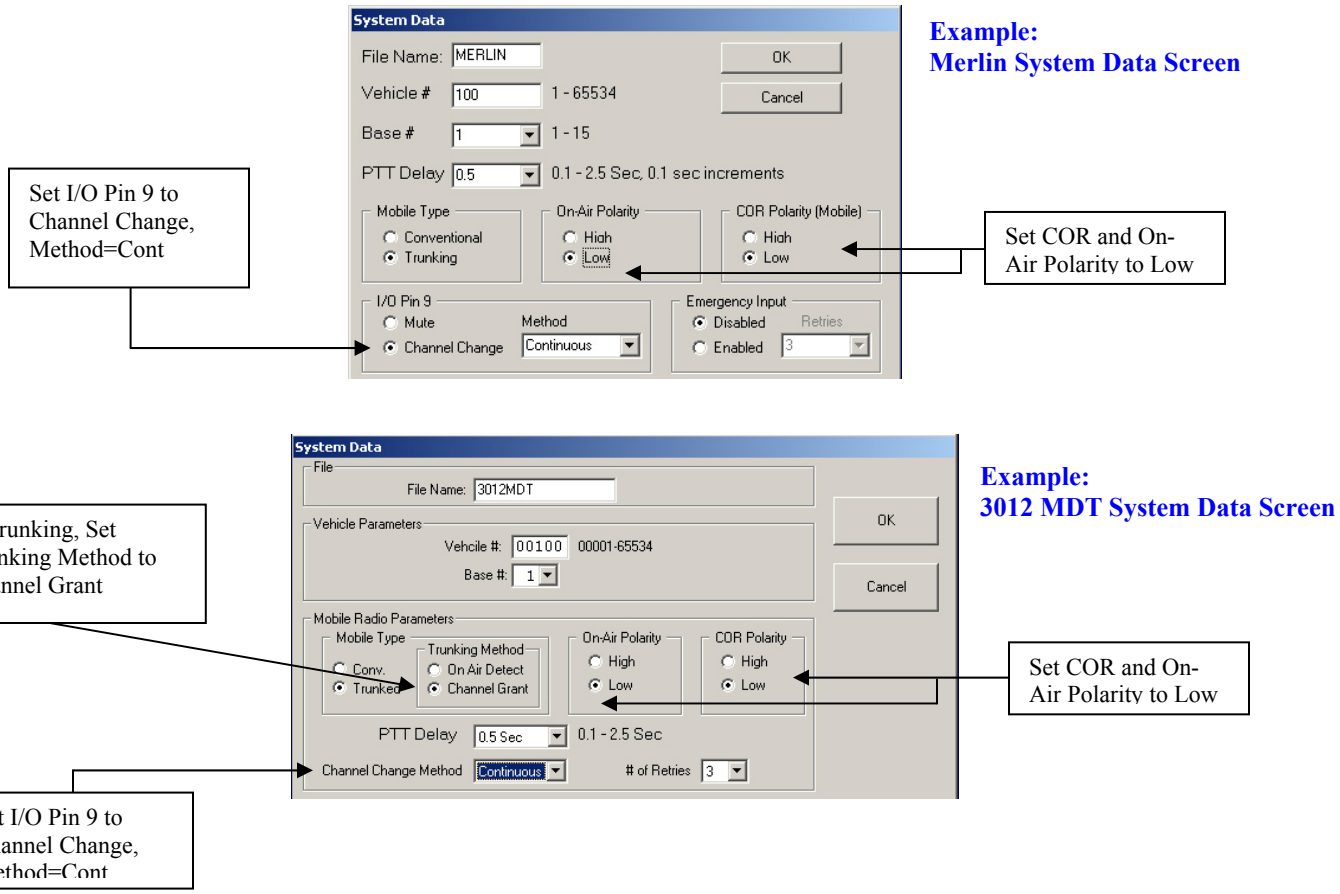
Programming the Pyramid Merlin or 2012/3012 MDT

The Pyramid AVL unit needs to be programmed to accommodate the polarities of signal that the Motorola CDM1550LS+ will provide it.

If you have not already done so, install the programming software on to your PC by following the instructions in the Merlin/2012/3012 MDT service manual.

Start by running the Pyramid Merlin/2012/3012 MDT programming software on your PC. From the ***Data*** pull down menu, under the ***System Data*** screen, program the unit as shown the figure below.

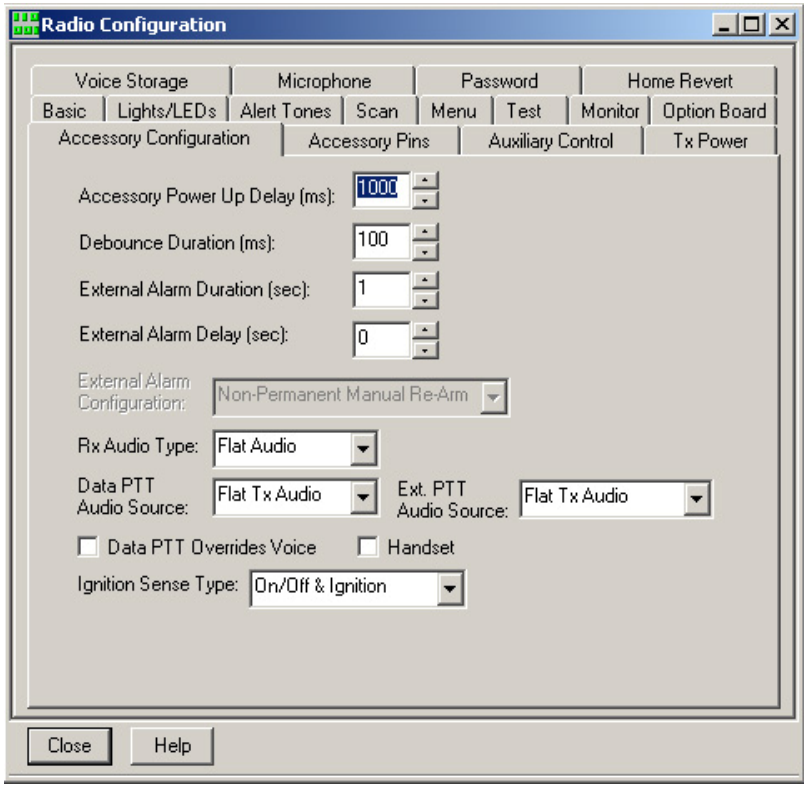
Note: Examples are from Merlin and 3012 MDT Programming. Other pyramid products are programmed with a similar layout.



Programming the CDM1550LS+ Mobile (Professional CPS)

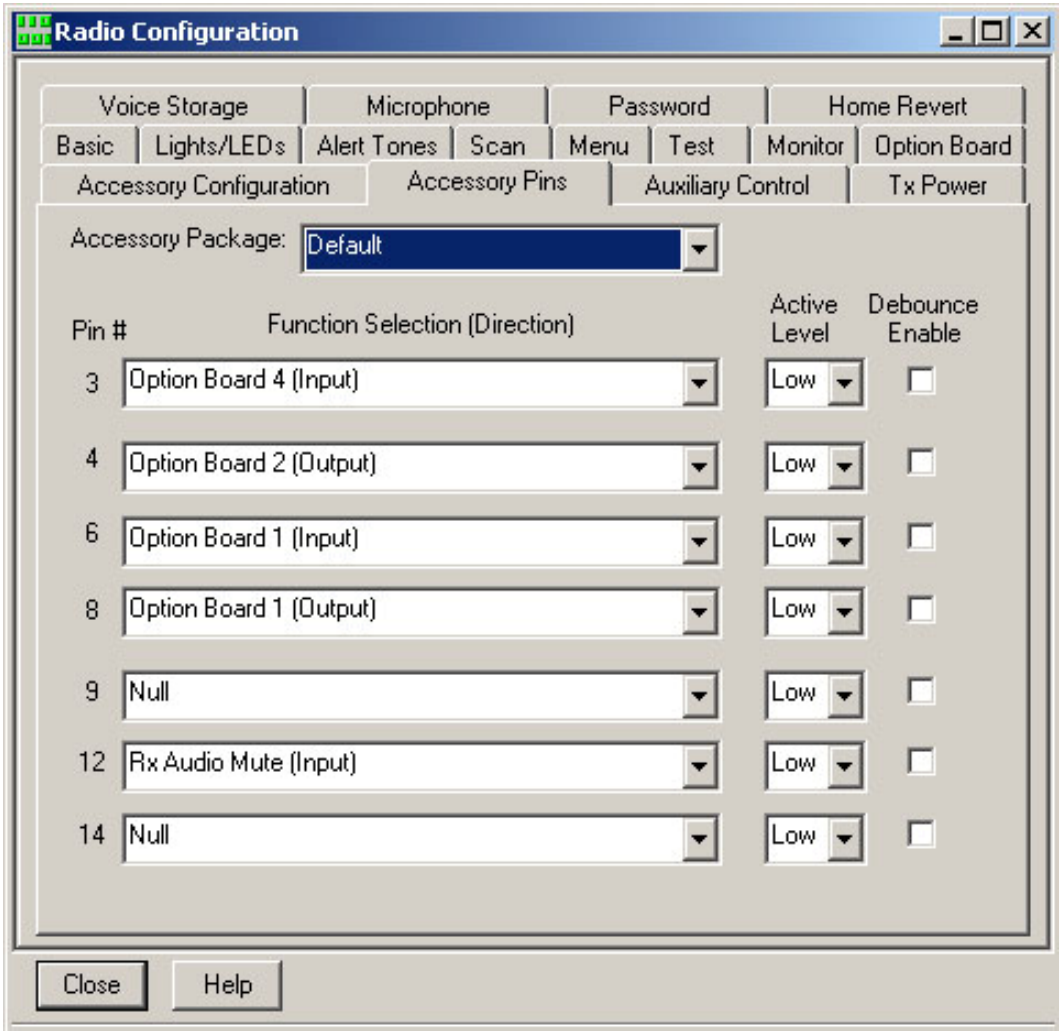
There are two objectives to programming the radios for mobile data or AVL usage. First, the Accessory port must be programmed to accommodate the Pyramid device. Second, the radio must be programmed to send data out over the Primary talk group.

CDM1550LS+ Accessory Port Configuration



1. Set the ***Rx Audio Output*** to "**Flat Audio"**. This will enable all RX audio from the discriminator of the radio to be available on the accessory connector of the radio.
2. Set the ***Data PTT Audio Source*** to **"Flat TX Audio"**. This ensures that the radio will not filter or distort any of the data audio.
3. Set the ***Ext. PTT Audio Source*** to **"Flat TX Audio"**. This ensures that the radio will not filter or distort any of the data audio.

Access the Accessories Pins menu by first reading the personality out of the CDM1550LS+ radio with the **Motorola Professional CPS** software. Select the ***Radio Configuration*** menu and click on ***Accessory Pins*** tab.



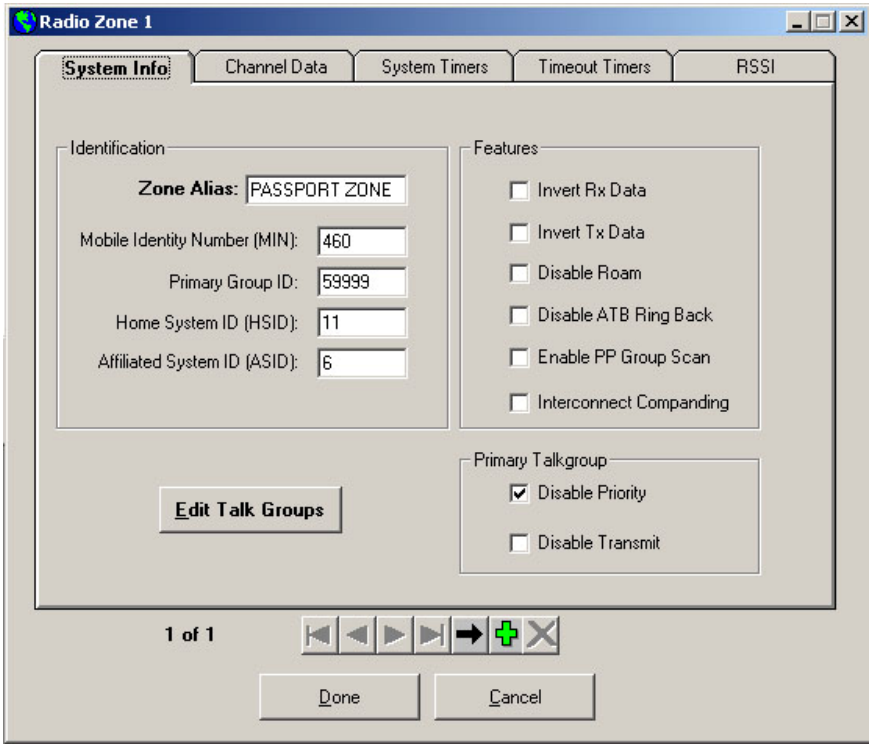
1. Program ***Pin 3*** of the accessory connector for ***"Option Board 4 (Input)" Active Low***
2. Program ***Pin 4*** of the accessory connector for ***"Option Board 2 (Output)" Active Low***
3. Program ***Pin 6*** of the accessory connector for ***"Option Board 1 (Input)" Active Low***
4. Program ***Pin 8*** of the accessory connector for ***"Option Board 1 (Output)" Active Low***
5. Program ***Pin 12*** of the accessory connector for ***"RX Audio Mute (Input)" Active Low***

CDM1550LS+ PassPort Mobile Group Programming (Professional CPS)

Program the PassPort Zone and PassPort Revert Zone as normally programmed in the Professional Radio CPS.

CDM1550LS+ PassPort Mobile Group Programming (PassPort CPS)

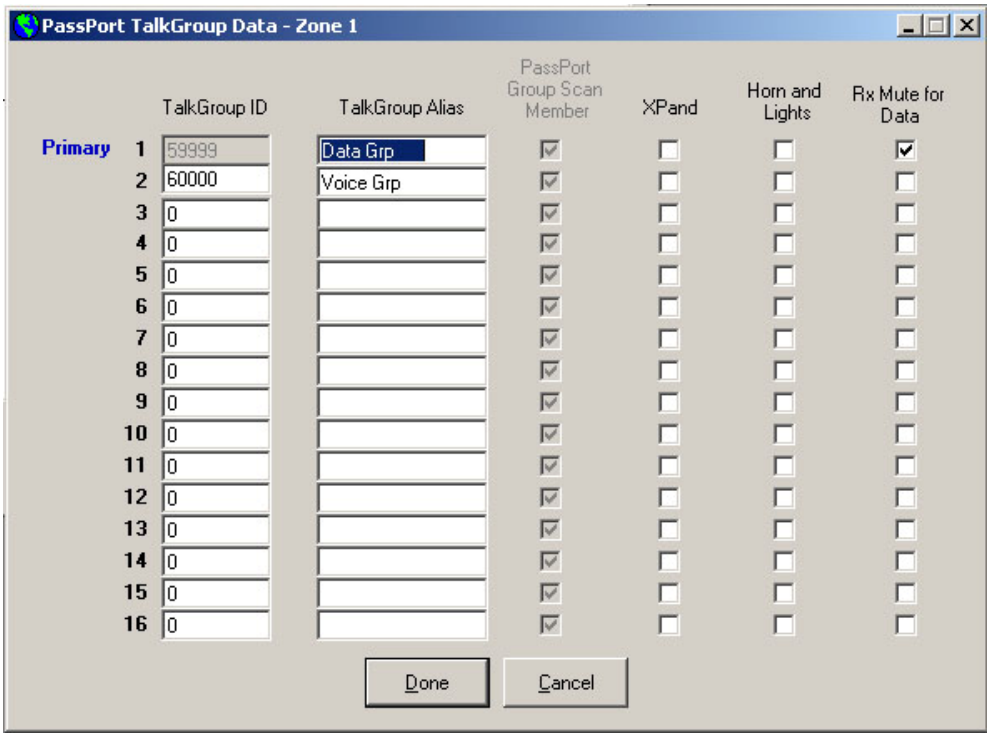
In the PassPort CPS, program your PassPort zone as usual. Ensure that the ***Features*** checkboxes are as shown below. Also ensure that the ***Disable Priority*** box is checked.



CDM1550LS+ PassPort Mobile Group Programming (PassPort CPS), Continued …

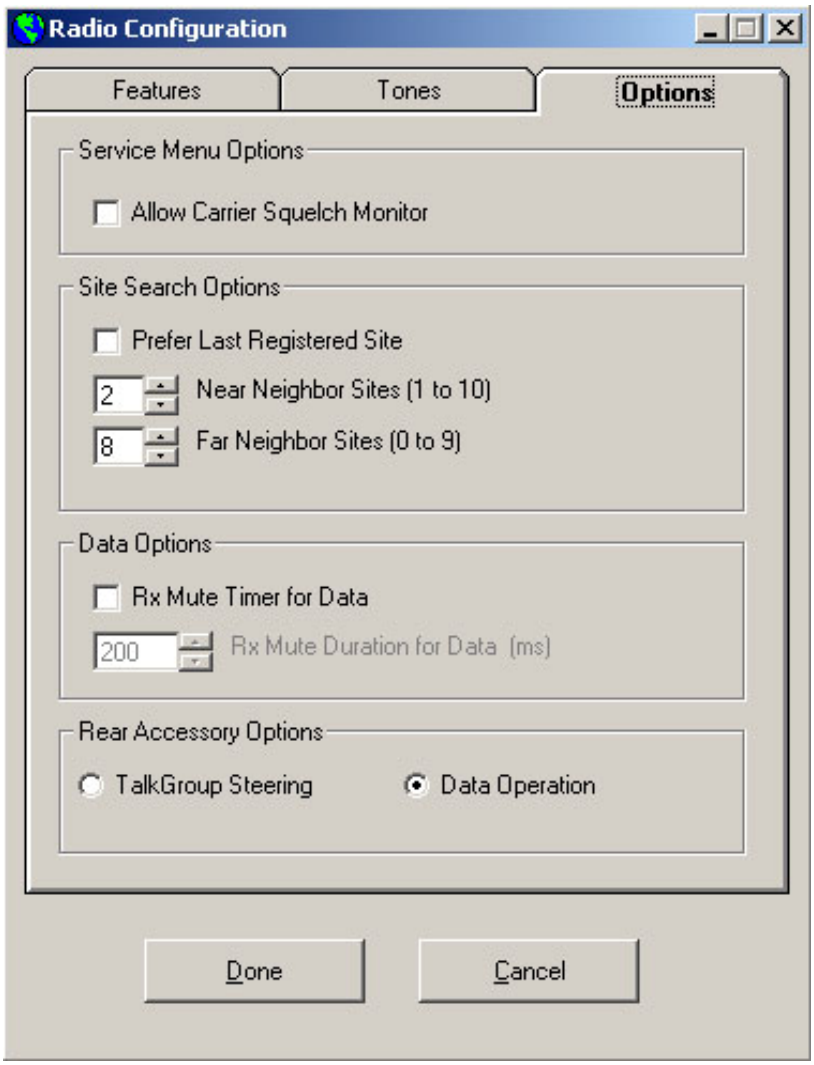
When setting up a mobile radio for data operation over PassPort, you will be configuring the radio to send data over the Primary talk group (See Appendix A). As sown below, program your groups as normal, but remember that the Primary talk group will not be available for voice usage.

Ensure that the ***RX Mute for Data*** is checked on the Primary talk group.



CDM1550LS+ PassPort Mobile Group Programming (PassPort CPS), Continued …

After all the group data has been set, it is necessary to enable data for this personality. From the **Radio Configuration / Options** screen, ensure that the ***Rear Accessory Options*** setting is on ***Data Operation***.

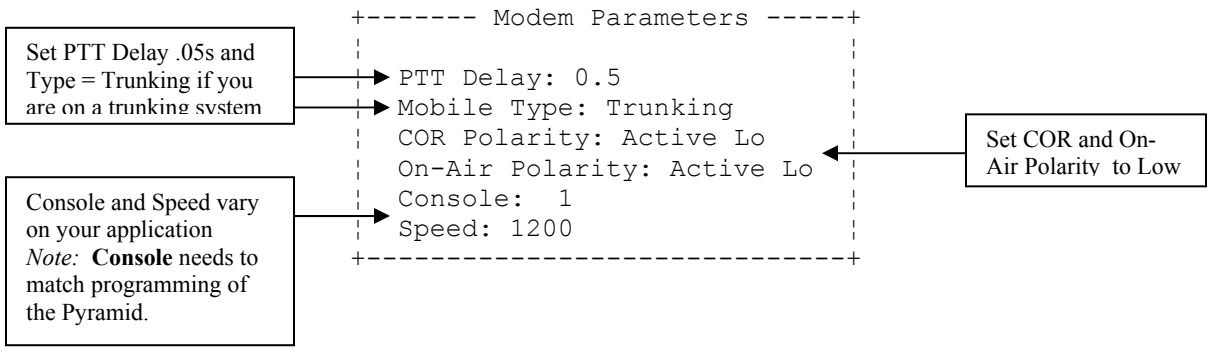


Base Configuration

Programming the 2016D Base Modem

Programming of the Pyramid 2016 base modem is done through the console interface. Typically, the parameters are set in the Pyramid Console software, and then automatically sent to the 2016.

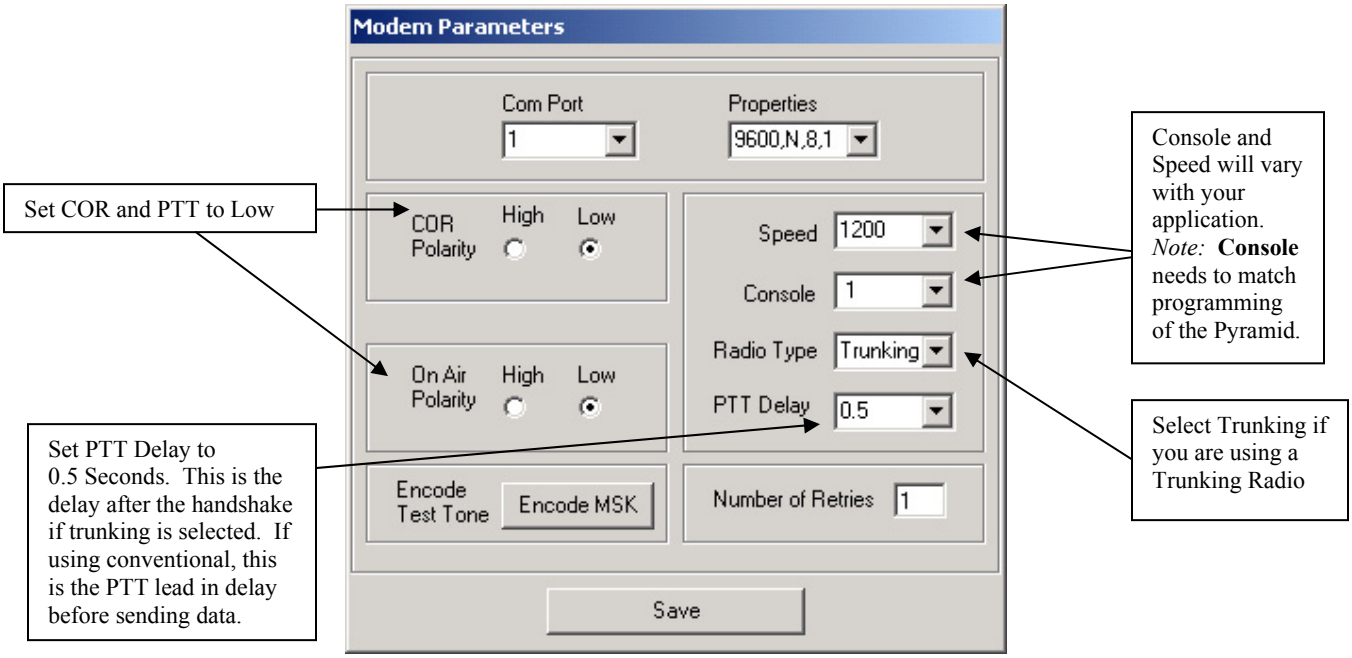
The figure below shows how a typical Pyramid Console software would be set up when connected to a 2016 and CDM1550LS+ radio. To access the ***Modem Parameters*** menu, select ***Configure*** from the pull down menu.


Set PTT Delay .05s and Type = Trunking if you are on a trunking system
Console and Speed vary on your application
Note: **Console** needs to match programming of the Pyramid.
+------- Modem Parameters -----+
PTT Delay: 0.5
Mobile Type: Trunking
COR Polarity: Active Lo
On-Air Polarity: Active Lo
Console: 1
Speed: 1200
+------------------------------+
Set COR and On-Air Polarity to Low

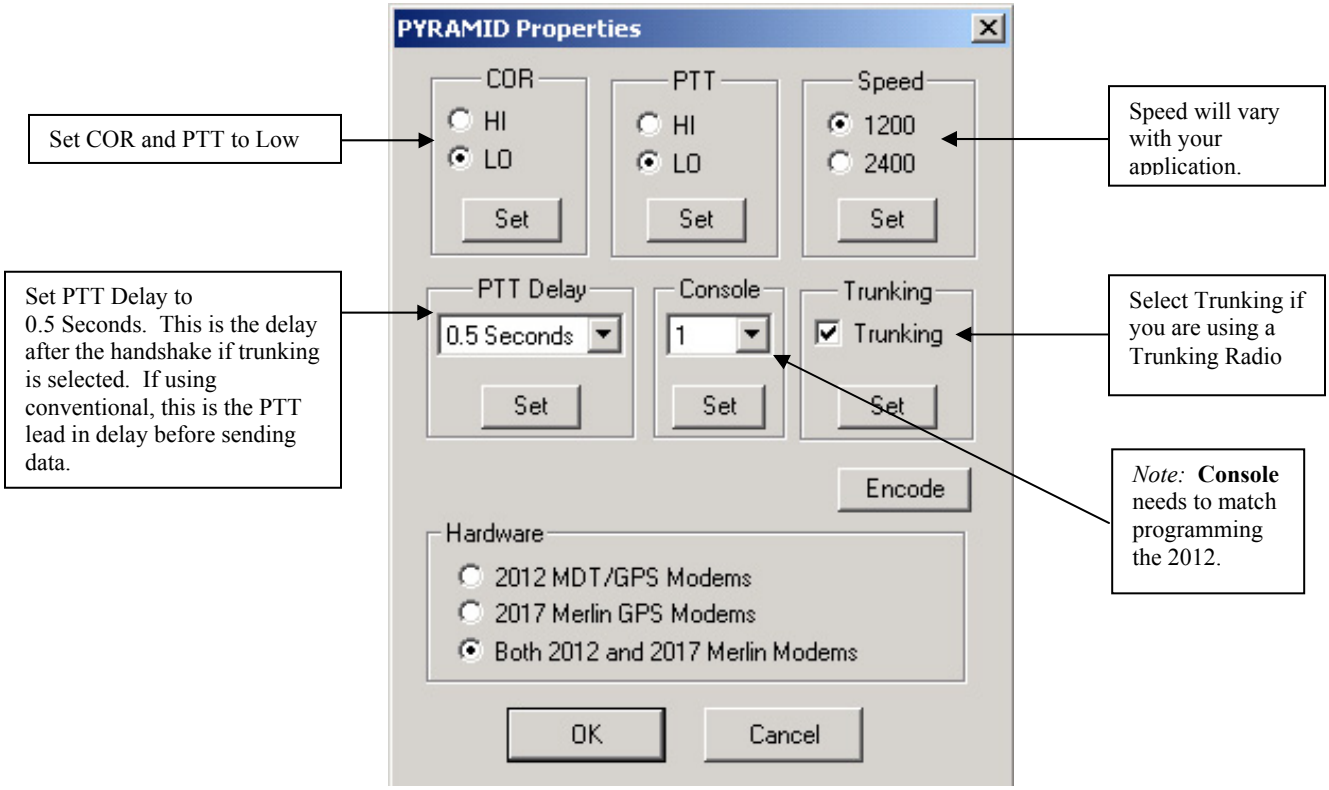
See the Pyramid 2016 service manual for further Pyramid Console software information.

Programming the Pyramid 2016 (Continued)

The figure below shows how Street Smarts modem parameters will be set up when connected to a 2016 and CDM1550LS+ radio. To access this configuration screen, select the ***Configure*** pull down menu in Street Smarts. Then click ***Modem Parameters*** to configure the 2016.



The figures below shows how a typical RasTrac I/O processor will be set up when connected to a 2016 and CDM1550LS+ radio. To access the I/O configuration, select the ***Edit*** pull down menu from the RasTrac I/O Processor. From the ***Input/Output Configuration*** screen, select the ***Protocol*** to be **PYRAMID**. Then click ***Properties*** to configure the 2016.



Note: If your I/O Processor does not include a "check box" parameter for enabling trunking, contact Manning Navcomp to obtain the latest version of I/O Processor.

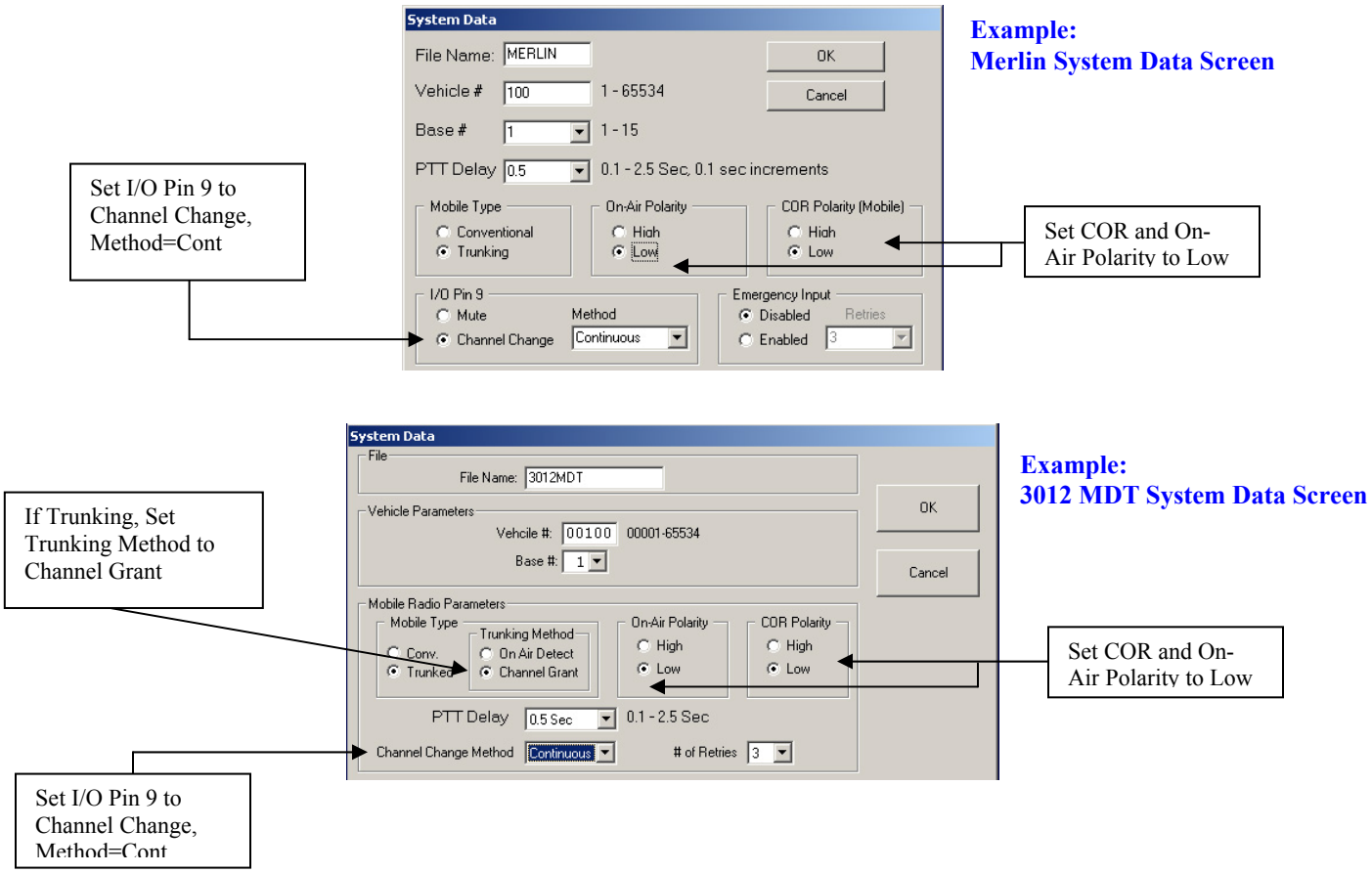
Programming the Pyramid Merlin or 2012/3012 MDT

The Pyramid AVL unit needs to be programmed to accommodate the polarities of signal that the Motorola CDM1550LS+ will provide it.

If you have not already done so, install the programming software on to your PC by following the instructions in the Merlin/2012/3012 MDT service manual.

Start by running the Pyramid Merlin/2012/3012 MDT programming software on your PC. From the ***Data*** pull down menu, under the ***System Data*** screen, program the unit as shown the figure below.

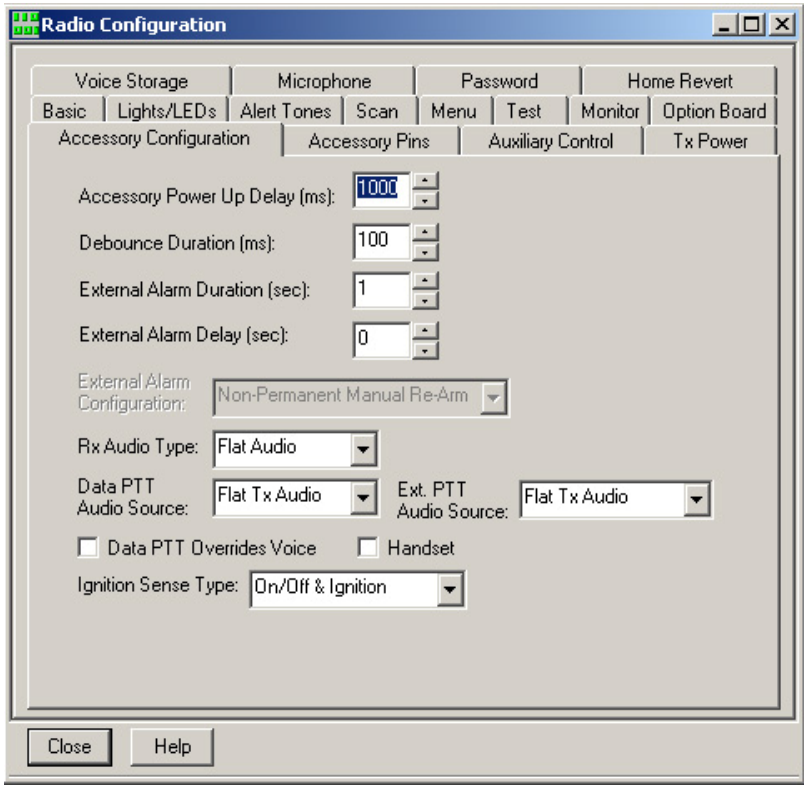
Note: Examples are from Merlin and 3012 MDT Programming. Other pyramid products are programmed with a similar layout.



Programming the CDM1550LS+ Base (Professional CPS)

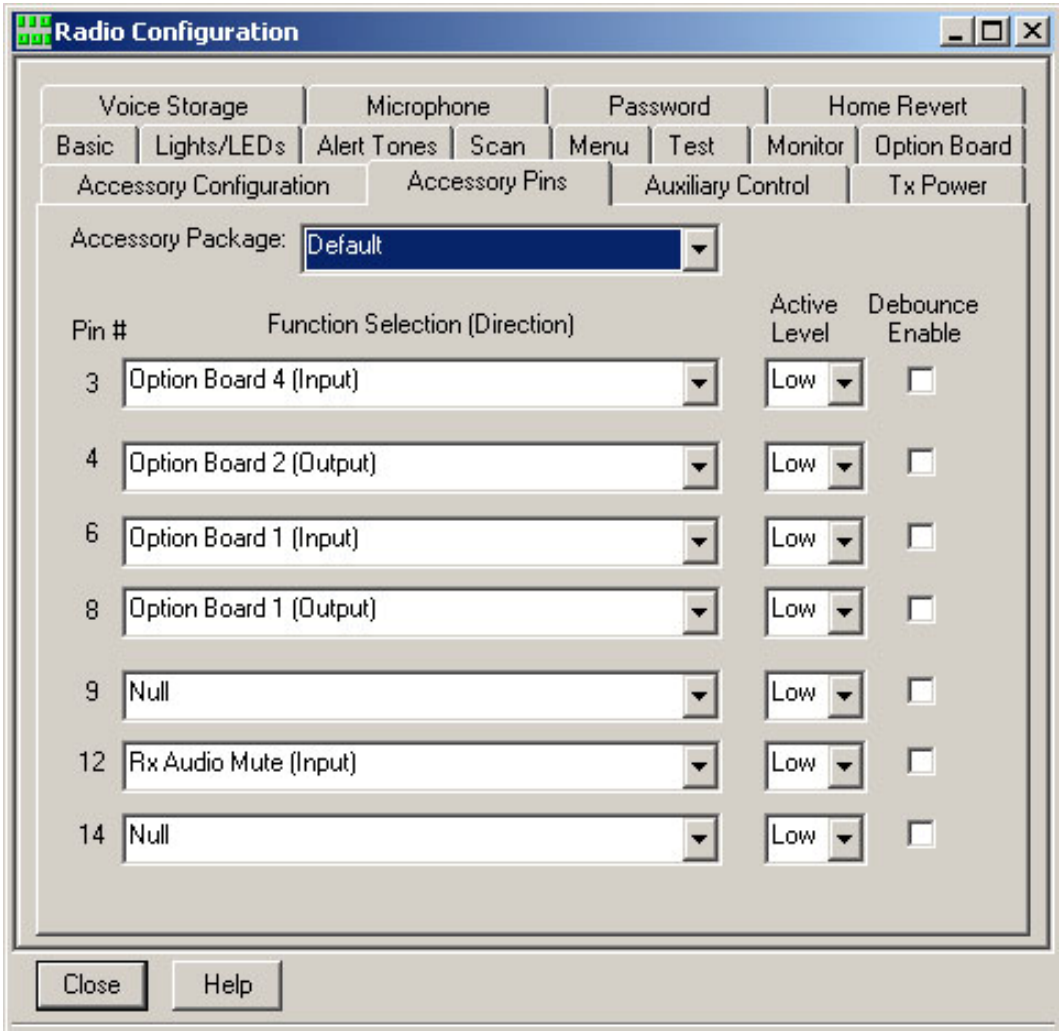
There are two objectives to programming the radios for mobile data or AVL usage. First, the Accessory port must be programmed to accommodate the Pyramid device. Second, the radio must be configured to send "dispatch originated messages" out over the voice group. This is opposite of how the mobile unit is programmed (See Appendix A).

CDM1550LS+ Accessory Port Configuration



4. Set the ***Rx Audio Output*** to "**Flat Audio"**. This will enable all RX audio from the discriminator of the radio to be available on the accessory connector of the radio.
5. Set the ***Data PTT Audio Source*** to **"Flat TX Audio"**. This ensures that the radio will not filter or distort any of the data audio.
6. Set the ***Ext. PTT Audio Source*** to **"Flat TX Audio"**. This ensures that the radio will not filter or distort any of the data audio.

Access the Accessories Pins menu by first reading the personality out of the CDM1550LS+ radio with the **Motorola Professional CPS** software. Select the ***Radio Configuration*** menu and click on ***Accessory Pins*** tab.



6. Program ***Pin 3*** of the accessory connector for ***"Option Board 4 (Input)" Active Low***
7. Program ***Pin 4*** of the accessory connector for ***"Option Board 2 (Output)" Active Low***
8. Program ***Pin 6*** of the accessory connector for ***"Option Board 1 (Input)" Active Low***
9. Program ***Pin 8*** of the accessory connector for ***"Option Board 1 (Output)" Active Low***
10. Program ***Pin 12*** of the accessory connector for ***"RX Audio Mute (Input)" Active Low***

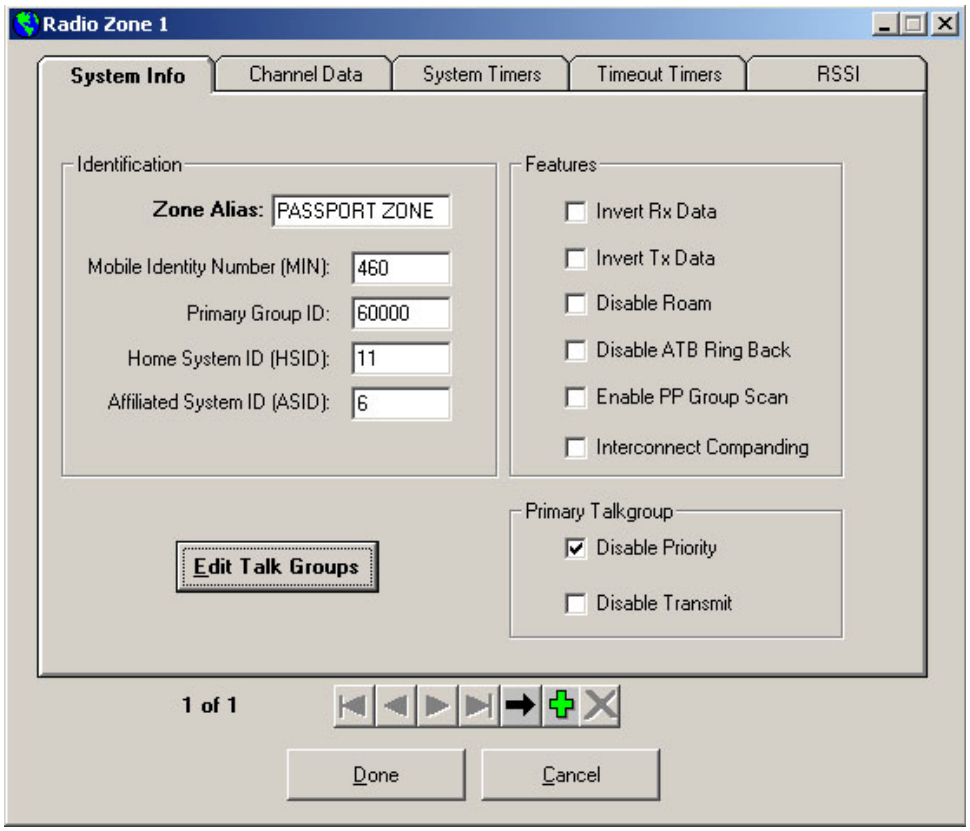
CDM1550LS+ PassPort Base Group Programming (Professional CPS)

Program the PassPort Zone and PassPort Revert Zone as normally programmed in the Professional Radio CPS.

CDM1550LS+ PassPort Base Group Programming (PassPort CPS)

In the PassPort CPS, set the ***Primary Group ID*** as the **Voice** group ID used in the system. This will be opposite from the mobile program, as we want to send "dispatch originated messages" out over the voice group (See Appendix A).

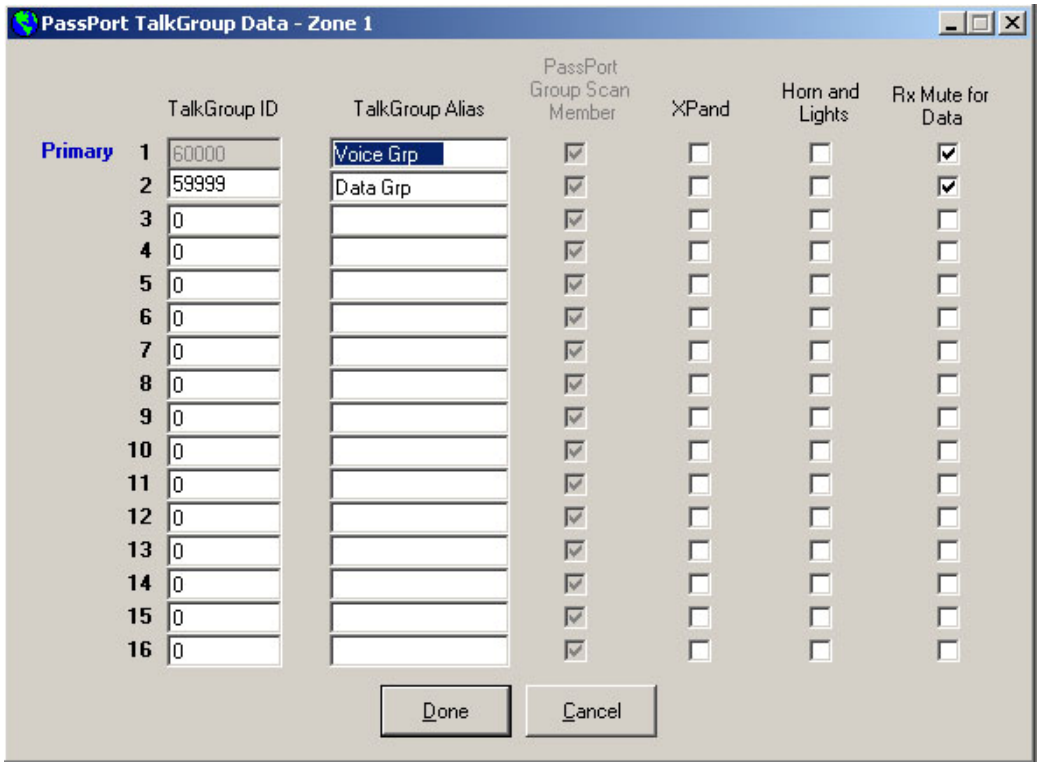
Ensure that the ***Features*** checkboxes are as shown below. Also ensure that the ***Disable Priority*** box is checked.



CDM1550LS+ PassPort Base Group Programming (PassPort CPS), Continued …

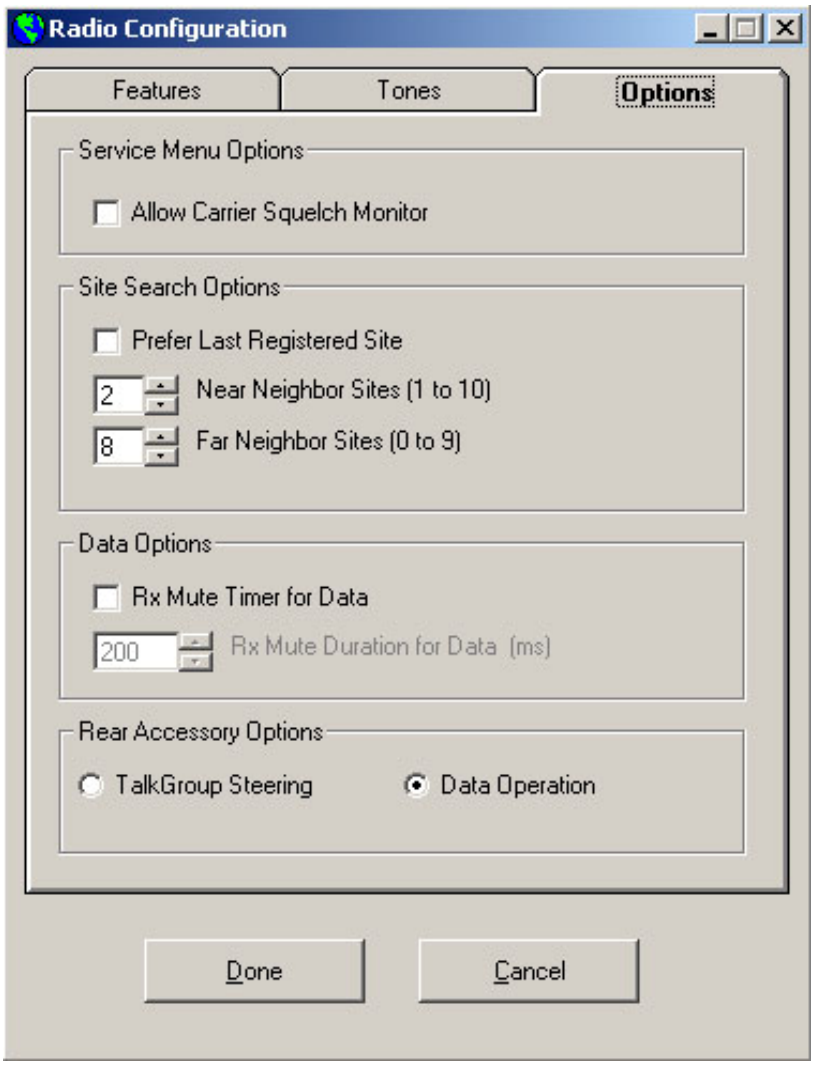
When setting up a mobile radio for data operation over PassPort, you will be configuring the radio to send data over the Primary talk group (See Appendix A). As sown below, program your groups as normal, but remember that the Primary talk group will not be available for voice usage.

Ensure that the ***RX Mute for Data*** is checked on **BOTH** talk groups. Since this radio will be dedicated for data operation, there is no need to listen to the data over the speaker.



CDM1550LS+ PassPort Base Group Programming (PassPort CPS), Continued …

After all the group data has been set, it is necessary to enable data for this personality. From the **Radio Configuration / Options** screen, ensure that the ***Rear Accessory Options*** setting is on ***Data Operation***.



Connecting the Pyramid units to the CDM1550LS+

Once all of the programming has been completed, it is time to connect the units to the radios.

Connecting the Merlin/2012/3012 MDT to the CDM1550LS+

The following are the pin outs for 16 Pin Accessory Connector located on the rear of the CDM1550LS+ Mobile. These connections must be made to the corresponding color-coded cable from the Merlin/2012/3012 MDT.

Connections:	**Merlin/2012/3012**	**Function**	**CDMLS+ 16 Pin Accy. Connector**
	Black/Shield	Ground	Pin 7
	White	Tx Audio Out	Pin 5
	Blue	On-Air Detect	Pin 8
	Green	PTT Out	Pin 3
	Red	Switched B+	Pin 13
	Yellow	Rx Audio In	Pin 11
	Violet	COR	Pin 4
	Brown	Audio Mute Out	Pin 12
	Grey	Mic Mute/Channel Select	Pin 6

Connecting the 2016 base to the CDM1550LS+

Connections:	**2016**	**Function**	**CDMLS+ 16 Pin Accessory Connector**
	Black/Shield	Ground	Pin 7
	White	Tx Audio Out	Pin 5
	Blue	On-Air Detect	Pin 8
	Green	PTT Out	Pin 3
	Red	Switched B+	Pin 13
	Yellow	Rx Audio In	Pin 11
	Violet	COR	Pin 4
	Brown	Audio Mute Out	Pin 12
	Grey	Mic Mute/Channel Select	Pin 6
	Teal	**Base Group Enable**	**Ground (Pin 7)**

Jumper Settings in the Merlin/2012/3012 or 2016

J1 [Out] Tx audio level
J2 [Out] Local PTT Loop

Alignment

Follow the alignment procedures located in your Pyramid Communications service manual for the product installed. It is important to align all of the Pyramid equipment prior to installing in field.

The easiest way to align a Pyramid unit is to add an extra conventional simplex channel to the mobile radio. Use this channel, in conjunction with the service equipment to perform the alignment.

Full service manuals are available at www.pyramidcomm.com/support.

Appendix A

Base Channel Change

In order to understand the operation of data channel change you have to realize that the mobile units are using the **PRIMARY** PassPort Group ID code for ***data*** and a separate PassPort Group ID code(s) for ***voice*** communication. When the MDT sends a message, the mobile radio is switched to the **PRIMARY** PassPort Group ID; after the transmission is complete, the radio reverts back to the ***voice*** ID code. The 2016 base unit receives and responds on the **PRIMARY** PassPort Group ID code.

A problem arises when the dispatcher needs to send an outbound message (e.g. GPS Poll, Text Message, Horn Honk, etc.). At most times, the mobile units are idle and therefore on the ***voice*** PassPort Group ID code. When a message from the base is sent, it is sent on the **PRIMARY** PassPort Group ID code, thus the targeted mobile unit does not receive the command from the dispatcher because it is listening on a different PassPort Group ID code.

To overcome this obstacle, the 2016 can be configured to change to the ***voice*** PassPort Group ID code when sending outbound, base originated messages. We accomplish this by fooling the base radio in its assignment of the **PRIMARY** Group ID. We set the **PRIMARY** Group ID in the base to the first ***voice*** group used in the system. As with all base modem installations, a dedicated radio is required for the 2016 base modem.

Enabling your 2016 for Voice Channel Change

There is a simple wiring harness change needed to enable the 2016 to activate the channel change line out of the 2016 Base Modem. From the 2016 wiring harness, connect the Teal wire to ground. This activates the Grey wire as the Voice Channel Select line.

If not already done, crimp a pin onto the Grey wire from the Pyramid Communications Model 2016 wiring harness and connect it to the 16 pin accessory connector **pin 6**.